

REMARKS**1. Request for Continued Examination:**

- 5 The applicants respectfully request continued examination of the above-indicated application as per 37 CFR 1.114.

All withdrawn claims are cancelled without prejudice or disclaimer to the merits thereof.

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2. Objection to claims 23 and 44 regarding phrase "at least one reaction layer":

- 15 Claims 23 and 44 are amended to overcome this objection. Claim 23 now recites "at least one of the first and second reaction layers" and claim 44 now recites "the first and second reaction layers" thereby clarifying the layers involved. No new matter is entered.

- 20 Accordingly, withdrawal of this objection is requested.

3. Rejection of claims 23-25, 27, 29-30, and 44 under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US 6,597,019) in view of Hahn et al. (US 2003/0168664):

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Claim 23 is amended only to overcome the above-mentioned objection.

- 30 Claim 44 is amended to overcome the above-mentioned objection, and also to further differentiate the claimed invention from the cited art. No new matter is entered.

Claims 45-51 are introduced to further differentiate the claimed invention from the cited art. Claim 45 is independent, Claims 47-51 correspond to co-pending dependent claims, and claim 46 is fully supported by the original disclosure. No
5 new matter is entered.

Regarding the rejection, the applicants argue that the Ni layer (5) is not "naturally readable as the second reaction layer as it is naturally capable of enhancing the adhesion by forming
10 a similar bonding reaction with a resin as in the instant case."

This argument is supported by col. 13, lines 35-39 of Inoue, describing an Au film that intervenes between the Ni layer
5 and the insulating resin 16:

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"A Ni film with a thickness of about 0.2 μm is further formed over the entire surface of the wafer, followed by an Au film with a thickness of about
1 μm formed thereon by vapor deposition,"

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and by col. 17, lines 10-12 of Inoue, describing a protective film disposed between the Ni layer 5 and the insulating resin
16:

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"The entire surface of the element is covered with a protective film 39 except for the microbumps."

Although Fig.3 shows the Ni layer 5 contacting the resin 16, the applicants argue that Inoue actually teaches that there
30 is significant intervening material between the Ni layer 5 and the resin 16, as the quotations above illustrate. Therefore, Inoue certainly cannot teach or suggest that the Ni layer 5

is for "enhancing the adhesion by forming a similar bonding reaction with a resin" since the Ni layer 5 does not substantially contact the resin 16.

- 5 Moreover, referring to Inoue's assertion as to the purpose of the microbumps (col. 26, line 46 - col.27, line 12):

10 "...the formation of the microbumps on the electrodes of the semiconductor light-emitting element or of the submount element is followed by **electrical/physical connection of the semiconductor light-emitting element to the submount element via the microbumps....**In bonding the corresponding electrodes of the two elements
15 to each other via the microbumps, however, the microbumps are destroyed to some extent depending on the connecting method....,"

the applicants argue that the adhesion characteristics of the
20 Ni layer 5 are of little concern to Inoue since the microbumps provide the physical connection.

Therefore, the applicants argue that there is no significant basis in the cited art for likening Inoue's Ni layer 5 to the
25 claimed second reaction layer, and that this comparison is the result of hindsight.

Moreover, Hahn does not teach or suggest using Cr "to enhance an adhesion provided by the transparent adhesive layer," as
30 recited in the claims.

As mentioned in the argument of Oct. 28, 2004, Hahn teaches

that the Cr layer promotes adhesion between a p-doped layer and metal layer in the following:

- 5 "[0013] To promote the adhesion of the reflective contact metallization to the p-doped layer, preferably provided therebetween is a radioparent contact layer substantially comprising at least one metal from the group Pt, Pd, Cr."
- 10 Simply because Cr promotes adhesion between a p-doped layer (e.g. GaN or AlGaN material in Hahn) and a metallization layer does not mean that Cr promotes adhesion of a transparent adhesive layer of material such as the claimed polyimide (PI), benzocyclobutene (BCB), and perfluorocyclobutane (PFCB)
- 15 materials. The inorganic GaN and AlGaN are physically and/or chemically dissimilar to the organic PI, BCB, and PFCB, so it would be unobvious to one of ordinary skill in the art that adhesion would be enhanced in both cases.
- 20 The applicants acknowledge the reference US 6,416,194 to Demiryont, however, the same applies. Demiryont teaches Cr used to enhance adhesion between Ag and glass, but does not suggest using Cr "to enhance an adhesion provided by the transparent adhesive layer," such as the claimed PI, BCB, and
- 25 PFCB materials. Ag and glass are substantially different from PI, BCB, and PFCB.

In conclusion, the applicants argue that the likening Inoue's Ni layer 5 to the claimed second reaction layer and the

30 motivation of using Cr because to enhance an adhesion provided by the transparent adhesive layer may both be a result of hindsight. The applicants respectfully request that the

Examiner consider this argument, and that this rejection be withdrawn.

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